NOAA DIVING PROGRAM

FY2001 ANNUAL REPORT

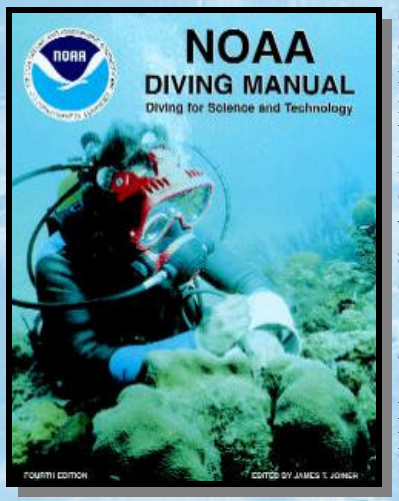
EXECUTIVE SUMMARY

The year 2001 marks the 30th anniversary of the formation of the NOAA Diving Program. Established in 1971, the NOAA Diving Program has progressed over the years from a loosely organized and minimally trained/equipped group of divers to a well organized, highly trained, and superbly equipped team of divers. Today diving continues to be an important tool for accomplishing essential work underwater in support of NOAA's data acquisition requirements.

During this 30th anniversary year of operations, 371 NOAA divers conducted 12,860 dives in support of NMFS, NOS, OAR, NWS, and OMAO research activities. However, the most significant dive statistic is the time NOAA divers spent underwater doing productive work. During FY '01, NOAA employees spent over 7,000 hours underwater conducting work directly associated with their assigned duties.

One of the most significant highlights of the year was the release of the 4th Edition of the NOAA Diving Manual in January, 2001. The latest edition is greatly expanded and completely revised to reflect the diversified tasks NOAA divers carry out underwater. While written to meet the needs of NOAA divers, it is also relevant to recreational, scientific, commercial, and military divers throughout the world. The publication is the result of a collaborative partnership between NOAA, the National Technical Information Service and Best Publishing Company.

The NOAA Diving Program has come a long way since its formation thirty years ago. Many of the lessons learned and technologies developed during this time have become "standards of the industry," thus benefiting not only NOAA divers, but divers everywhere. In the future, NOAA will continue to explore new ways of improving the safety and efficiency of diving.



SAFETY

During FY2001, the NOAA Diving Program continued its excellent safety record with only 2 reported cases of decompression sickness (DCS), a 99.98% safe dive rate. Both cases of DCS were "undeserved," occurred during repetitive dives, and were successfully resolved by treatment in a recompression chamber. Since 1989, NOAA divers have completed over 128,000 dives with a safe dive rate of 99.98%, or 1 DCS case every 5,000 dives.

LINE OFFICE DIVING ACTIVITIES FY2001

NATIONAL MARINE FISHERIES SERVICE (NMFS)

The mission of NOAA Fisheries is to provide stewardship of the nation's marine resources through science-based management. Its goals are to: 1) rebuild and maintain sustainable fisheries, 2) promote the recovery of protected species, and 3) protect and maintain the health of coastal marine habitats. To accomplish these goals, a number of fisheries researchers work underwater collecting data, conducting surveys, installing and recovering instrumentation, and evaluating fishing gear performance. One hundred forty two (142) NMFS divers conducted 5,699 dives for 3,252 hours of bottom time.

Fisheries divers in the northeast region conducted environmental studies in cooperation with the EPA and assessed essential fish habitat. A new study on lobster in Long Island Sound was initiated and studies on finfish habitat and shellfish grow-out were continued.

In the southeast, fisheries researchers evaluated the impact to, and recovery of, critical fishery and endangered species habitat in the Florida Keys National Marine Sanctuary and evaluated the new fisheries management plan for the Keys and Dry Tortugas Ecological Reserve. They assisted with fish assessments at Gray's Reef National Marine Sanctuary and evaluated habitat and feeding activities of the Antillean manatee in Puerto Rico. Fishing gear researchers evaluated new turtle excluder and bycatch reduction device designs for use in southeastern United States trawl fisheries. They also evaluated gear modifications to prevent the incidental capture of sea turtles by longline fishing gear used in Atlantic and Pacific fisheries. Divers conducted coral damage assessments and monitored coral restoration projects off Florida and American Samoa.

Diving units in the northwest region engaged in studies of essential fish habitat including growth rate studies of shallow water sponges and gorgonian corals in Alaskan waters.

NMFS Divers Sampling with "Scuba Net"

Fisheries divers captured Stellar sea lions to help determine why their numbers are declining and installed and maintained underwater transducers used to deter California sea lions from feeding on endangered salmon at the Ballard Locks in Seattle, WA. Continued research included king and tanner crab population studies in Alaska and the assessment of fish passage through surface trawl gear deployed in the Columbia River.

In the southwest region, fisheries divers assessed community changes off north and central California and determined recruitment strength of near-shore rockfish species along the California coast.

NATIONAL OCEAN SERVICE (NOS)

The mission of the National Ocean Service is to serve as the nation's advocate for coastal and ocean stewardship and to support and provide the science, information, management, and leadership necessary to balance the well-being of the nation's coastal resources and communities. NOS divers play an important part in this process through assessment, restoration, monitoring, and documentation. One hundred forty two (142) NOS divers completed 5,029 dives for 2,998 hours of bottom time.

FY2001 NOAA DIVING ACTIVITY

	Divers	*Dives*	*Bottom T*
NMFS	***142***	***5699***	***3252 hrs***
NOS	***142***	***5029***	***2998***
OAR	***10***	***169***	***72***
OMAO	***77***	***1963***	***1007***
TOTALS	***371***	***12860***	***7329***

Divers from the NOS Field Operations Division on both the Atlantic and Pacific coasts dove in support of the National Water Level Observation Network (NWLON), the Physical Oceanographic Real Time Monitoring System (PORTS), and other related projects. These divers are tasked with the engineering, installation, repair, and removal of tide and current meters in support of these projects and NOAA hydrographic survey projects. Meter stations provide critical data needed by NOS, NOAA's National Weather Service, coastal zone management, and the marine engineering, transportation, and surveying communities.

Closed Circuit Rebreather Training

The Office of Ocean and Coastal Resources Management (OCRM) utilizes divers to support its management of thirteen National Marine Sanctuaries. During FY2001, sanctuary divers conducted ongoing operations in support of education, research, restoration, management, assessment, monitoring, surveying, and enforcement. In addition to these activities, divers from the Upper and Lower Florida Keys sanctuaries also installed and maintained vessel mooring and boundary buoys, recovered derelict or illegal lobster traps, fish traps, and man-made habitats, assisted in search and recovery operations, participated in saturation diving in the Aquarius underwater habitat, and dove in support of the Sustainable Seas Expedition submersible dives. Channel Islands sanctuary divers assisted the Channel Islands National Park Service with their kelp monitoring program, collected underwater video on numerous sanctuary activities for educational programs, and located and documented shipwrecks within the sanctuary. Sanctuary divers are critical to the health, understanding, and management of the nation's marine sanctuaries.

OFFICE OF OCEANIC AND ATMOSPHERIC RESEARCH (OAR)

The mission of the Office of Oceanic and Atmospheric Research is to provide comprehensive knowledge to guide environmental policy decisions, improve environmental services, and promote economic growth through science. NOAA diver scientists and engineers at OAR laboratories are responsible for the design, testing, installation, maintenance, and removal of critical monitoring and data collection instrumentation. These instrument packages collect a variety of data that is used by NOAA's OAR as well as by outside agencies. Ten (10) OAR divers completed 169 dives for 72 hours of bottom time.

Divers for the Atlantic Oceanographic and Meteorological Laboratory (AOML) provided vital diving services to the Coral Reef Early Warning System (CREWS) project, the Offshore Dredge Material Disposal Site (ODMDS) studies, the Florida State Circulation and Exchange study, and the Biscayne Bay Submarine Groundwater Discharge (SGD) study. AOML divers tested and modified sensors, and performed needed inspection and maintenance of CREWS buoys and sensors. In support of the ODMDS study, a joint study between NOAA, EPA, and the Army Corps of Engineers, AOML divers maintained bottom-mounted ADCP and water quality sensors at several locations off Florida. OAR divers routinely retrieved data from CTD/ADCP instrument sites in Florida Bay and the Florida Keys and examined and sampled several possible freshwater upwelling sites in Biscayne Bay for the joint OAR/

Removal of Hazard to Navigation

Coral Restoration in Florida Keys

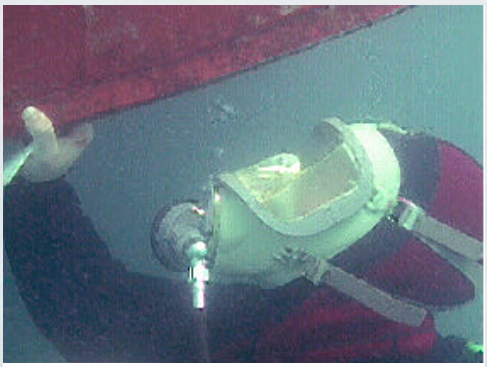
NOS SGD study.

OAR divers from the Pacific Marine Environmental Laboratory (PMEL) field tested various underwater mountings, moorings, acoustic releases, sensors, CTD systems, and various other systems in support of PMEL programs. Operations included the evaluation and comprehensive field testing of Bottom Pressure Recorders (BPRs) and Acoustic Extensometers. In-water infrared data download capability was developed as a result of this testing. This technology was later used for in-water data recovery from a deep water PMEL instrument package. PMEL divers also trained shipboard divers in the retrieval and deployment of underwater instrument packages to support PMEL's Tropical Atmosphere Oceans (TAO) array program.

OFFICE OF MARINE AND AVIATION OPERATIONS (OMAO)

SHIPS

OMAO divers aboard NOAA's fleet of fifteen fisheries research, oceanographic, and hydrographic survey vessels performed underwater tasks in support of both the collection of scientific data (scientific equipment installation, maintenance and removal, sample collection, and data collection) as well as vessel operations (routine and emergency maintenance and repairs, item investigations, etc.). Ship's divers are an integral support element essential to shipboard research missions and often participate in the planning, as well as the execution of underwater research activities. Divers support their ships by unfouling screws, clearing bowthrusters and sea chests, cleaning and replacing transducers, and conducting detailed hull inspections. Dives are often made under arduous conditions in low visibility, high current, rough seas, or congested harbors. Seventy seven (77) OMAO divers conducted 1,963 dives for 1,007 hours of bottom time.



Ship's Diver Conducting Hull Inspection

Divers aboard NOAA's fishery research vessels dove in support of various NMFS investigations, as well as ship-critical missions. Divers from the NOAA Ship TOWNSEND CROMWELL dove in support of the Northwest Hawaiian Islands (NWHI) coral reef assessment and restoration projects, assisting in the recovery of more than 69 tons of reef debris and completing over 395 km of video transects. OREGON II divers supported coral reef and seagrass research in the Dry Tortugas off the Florida Keys. Divers from the ALBATROSS IV provided critical routine maintenance for the northeast fisheries aquarium. GORDON GUNTER divers supported data collection during the Great American Fish Count.

Divers from NOAA's hydrographic survey vessels RUDE, WHITING, and RAINIER dove in support of ship hydrographic operations. Such work involves identifying and recording critical measurements from located hazards to navigation and installing and maintaining tide gauges in support of hydrographic measurements. Operating areas included waters off the Pacific Northwest and Alaska, the east coast of the U.S., and Puerto Rico.

Divers aboard the NOAA Ship FERREL conducted fish surveys and counts, instrument deployments and recoveries, video and photographic surveys, coral and reef fish sample collections, and reef mapping in support of Gray's Reef NMS and the Florida Keys NMS. Divers from the McARTHUR dove in support of the Sustainable Seas Expedition, collected coral and algae samples, and participated in fish surveys.

RONALD H. BROWN divers conducted artificial reef video documentation for NMFS Alaska, and dove in support of NOAA's EPIC project.

Surface Supplied Diver Training

NOAA DIVING CENTER (NDC)

NOAA dive training and dive-related medical training is conducted at the NDC training facility in Seattle, WA and also in Key West, FL. Dive training programs range from basic scuba to advanced specialties and include snorkeling, open circuit scuba, surface supplied, polluted water, and diving supervision. During FY2001, 106 persons were outfitted, trained, and certified by NDC personnel in one or more of these specialties. Unit Diving Supervisors and NDC certified an additional 19 Scientific divers nationwide. Additional courses taught at the NOAA Diving Center include Emergency Medical Technician, Dive Medic, First Aid, CPR, oxygen administration, Visual Cylinder Inspection, Nitrox, and Diving Medical Officer. An additional 203 persons were trained in one or more of these specialties during the fiscal year.

In addition to NOAA employees, students from other federal, state, and municipal agencies frequently enroll in classes on a

space available basis. Outside agency participation in FY2001 included:

US Customs
US Fish & Wildlife
Bureau of Mineral Management
Alaska Dept. of Fish & Game
King County (WA)
Sheriff's Dept.
Seattle (WA) Harbor Patrol
Renton (WA) Fire Dept.
Naperville (MI) Police
United States Coast Guard
US Secret Service
University of Washington
State of Florida
Pierce County (WA)
Sheriff's Dept.
Port of Seattle (WA) Police
Seattle (WA) Fire Dept.

Several new developments originated from the NOAA Diving Center during FY2001. Most notable were:

- Initiation of a dive computer test and evaluation study. This study identified and tested several commercially available dive computers for use by NOAA divers. Computers that would best meet the needs of NOAA divers were selected, bench tested, and finally diver tested. Widespread authorization of dive computer use by NOAA divers is expected during FY2002.
- Initiation of a Closed Circuit Rebreather (CCR) literature study to identify commercially available CCR's for use by NOAA divers. Third party testing of selected units will commence in FY2002.
- Implementation of new diving medical standards. Significant changes to existing medical standards and forms were made to better address diving medical considerations while simplifying the diving physical examination process.

Personnel from the NOAA Diving Center supported activities of the NOAA Line Offices, state and local government agencies, educational institutions, community groups, and the general public. These outreach efforts consisted of technical guidance, operational support, and educational services. The following activities were accomplished during FY2001:

Technical Guidance and Assistance

- Inspected equipment involved in a diving fatality for the Tacoma (WA) Police Department.
- Provided technical guidance to a NOAA contractor regarding installation of dive support and gas mixing systems aboard OMAO's YTT vessel.
- Completed final review and approved publication of the NOAA Diving Manual, 4th Edition.

Dive Accident Management Training

Operational Support

- Provided ship husbandry services for the NOAA Ships FAIRWEATHER, RONALD H. BROWN, and YTT, and USCG vessels.
- Inspected, cleaned, and video taped YTT hull and removed oil boom fouled in screw.
- Investigated potential placement of a recompression chamber in American Samoa including consultation trips to American Samoa and Juneau, Alaska.
- Conducted on-site Scientific diver and dive supervisor training and evaluation at NMFS Hawaii lab.
- Continued refurbishment of a 54" double lock recompression chamber.

Polluted Water Diver

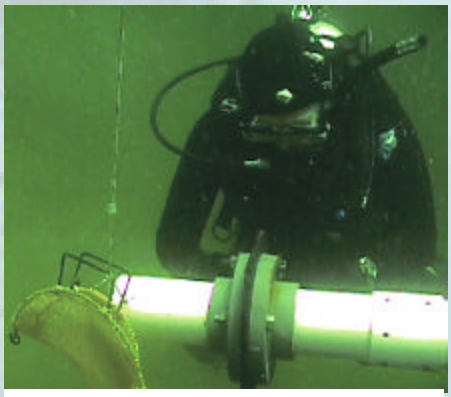
Educational Services

- Conducted tours of the NDC facility to persons from other NOAA offices, local law enforcement, the Hong Kong Fire Department, Divers Institute of Technology, Naval Undersea Museum, Virginia Mason Medical Center, and faculty and students from several local academic institutions.
- Held first ever NOAA Unit Diving Supervisor's conference in Seattle, WA.
- Conducted 2-week Public Safety Diver course for local fire and police
- Lectured for Virginia Mason Medical Center hyperbaric technician course.

FY2001 marked the 12th year of the NOAA Diving Program's Standardized Equipment Program (SEP) that provides diving equipment to all NOAA divers. During FY2001 the SEP program fully outfitted 61 new and returning divers, performed annual maintenance and re-issued 320 regulators, and serviced and re-issued an additional 100 octopus regulators.

ACKNOWLEDGEMENTS

The images and information represented in this report reflect the efforts of many dedicated NOAA employees who use diving as a tool to accomplish vital research, monitoring, and maintenance projects. It is through these efforts that the NOAA Diving Program continues as one of the most active and respected civilian diving programs in the United States.



Mid-Water Flange Training Project